UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

May 30, 2002

Colonel Ralph H. Graves
Corps of Engineers, Seattle District
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Biological Opinion on the Woodard Creek Bridge 14/109 Stabilization Project, Skamania County, WA (NMFS No. WSB-01-401, COE No. 2000-4-00664)

Dear Colonel Graves:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) concluding formal Endangered Species Act consultation on the SR 14/Woodard Creek Bridge Repair project in Skamania County, Washington as described in the Washington State Department of Transportation's biological assessment (BA) dated July 2001. This Opinion addresses Lower Columbia River steelhead (*Onchorynchus mykiss*), Columbia River chum salmon (*O. keta*), and Lower Columbia River chinook salmon (*O. tshawytscha*). Lower Columbia River/Southwest Washington coho salmon (*O. kisutch*), a candidate species, has also been considered in this opinion.

The NMFS has determined that the proposed action is not likely to jeopardize the continued existence of the listed species described above or adversely modify designated critical habitat. An Incidental Take Statement provides non-discretionary terms and conditions to minimize the potential for incidental take of listed species.

In addition, this document also serves as consultation on Essential Fish Habitat for coho and chinook salmon under the Magnuson-Stevens Act and its implementing regulations (50 C.F.R. 600).

We appreciate the considerable effort and cooperation provided by your staff in completing this consultation. If you have any questions regarding this Opinion, please contact Bill Leonard at (360) 753-9887 of my staff in the Washington State Branch Office.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure

cc: Kelley Jorgensen, WSDOT

Endangered Species Act - Section 7 Consultation

BIOLOGICAL OPINION

&

Magnuson-Stevens Act
Essential Fish Habitat Consultation

SR 14 Woodard Creek Bridge Stabilization and
Streambank Repair Project, Skamania County, Washington
WSB-01-401

Agency: U.S. Army Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Approved by: For Michael R Crouse
D. Robert Lohn
Regional Administrator

Date: June 4, 2002

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1.0 INTRODUCTION

1.1 Background and Consultation History

On September 12, 2001, the National Marine Fisheries Service (NMFS) received a Biological Assessment (BA) and a request for Endangered Species Act (ESA) section 7 consultation from the United States Army Corps of Engineers (COE). Formal consultation was initiated on May 7, 2002. The BA and subsequent email from Kelley Jorgensen described a proposal by Washington State Department of Transportation (WSDOT) to repair and stabilize bank erosion adjacent to Woodard Creek Bridge located on State Route (SR) 14 at mile post (MP) 34.24, in Skamania County, Washington. The BA also described the repositioning of boulders and large cobbles to reopen a blocked side channel.

The proposed project area occurs within the Lower Columbia River (LCR) chinook salmon (*Onchorhynchus tshawytscha*), Columbia River (CR) chum salmon (*O. keta*), and LCR steelhead (*O. mykiss*) Evolutionary Significant Units (ESU). Woodard Creek drains into the CR approximately 30 miles east of the city of Vancouver. The COE had determined that the project "may affect, and is likely to adversely affect" LCR chinook and LCR steelhead. Additionally, the COE had determined that the project "may affect," but is "not likely to adversely affect" CR chum salmon (*O. keta*). NMFS, however, has determined that the project may affect, and is likely to adversely affect CR chum salmon.

The objective of this Biological Opinion (BO) is to determine whether the proposed project is likely to jeopardize the continued existence of LCR chinook, CR chum, or LCR steelhead. The standards for determining jeopardy are described in section 7(a)(2) of the ESA and further defined in 50 C.F.R. 402.14. This BO is based on the information presented in the BA, phone conversations, and email correspondence. This document also presents NMFS' consultation covering Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

1.2 Description of the Proposed Action

The proposed Federal action is the issuance of a permit to the WSDOT for the repair and stabilization of bank surface erosion adjacent to the Woodard Creek Bridge. Woodard Creek Bridge 14/109 is a 130-foot long concrete T-beam structure with pier footings on each bank. High water events in 1998 and 1999 eroded the bank immediately upstream from the west bridge abutment. Bank erosion has progressed so that the foundation of the traveled roadway and bridge abutment is at risk with future high-water events.

WSDOT will repair and permanently stabilize bank surface erosion by installing a series of stream barbs and reconfiguring the slope through bioengineering techniques. Large woody debris (LWD) will be incorporated along the west bank of the creek and rock will be repositioned on the east bank to reopen an old channel that has been blocked by 100-year flood depositions. In addition, the west wing wall of the bridge will be reinforced with concrete.

Three stream barbs will be installed along the west bank of Woodard Creek, approximately 20 feet, 170 feet, and 220 feet from the northwest abutment of the bridge. The barbs will extend across approximately one-third of the channel width, and will be positioned to realign and dissipate flow energy away from the destabilized embankment. An existing large boulder, situated on the west bank approximately 100 feet upstream from the bridge, currently provides the hydraulic functions of a barb. Each barb will be keyed into the existing slope from the 100-year floodplain elevation to below the ordinary high water mark (OHWM). At the base of each barb, approximately three cubic yards of existing bank soil will be excavated and countersunk with rock to create a tie-back key. An estimated 40 cubic yards of heavy-loose basaltic rock (3-5 feet diameter) will be used to construct each barb. Each barb will measure about ten feet long, six feet across, and six feet deep, and will taper slightly from the bank to the tip. The height of the barbs is determined from the low flow depth; barb tips will be set at low flow with the crest sloped up to the 100-year floodplain elevation where the barbs connect with the bank.

A total of approximately 90 cubic yards of the rock used for the barbs will placed below the OHWM. These structures will be installed with an upstream angle of 35°. LWD and live willow cuttings will be incorporated into the barb structures. A track-hoe excavator equipped with a hydraulic thumb for grasping materials will be used to construct the rock and log barb structures. Six ecology blocks placed at the northwest wing wall during previous work will be permanently removed.

A geotextile soil lift structure will be constructed to stabilize surface erosion along the west bank of Woodard Creek. This structure consists of successive layers of soil wrapped in either a natural or synthetic geotextile alternated with brush layers. The structure will encompass a vertical distance of about 15 feet along 250 feet of streambank. The structure, installed after barb construction, will be sloped back from the stream to create a stable, heavily vegetated bank section.

Deposition of boulders, cobble, gravel and LWD during flood events in the late 1990's blocked surface flow to a secondary channel across the creek from the destabilized bank. This project will restore surface flow to the secondary channel by repositioning approximately 30 cubic yards of these native boulders and cobble. This work will be accomplished using a track-hoe excavator equipped with a hydraulic thumb that will operate from a the end of one barb structure.

Project work will include the removal of up to seven trees along the top of the west bank to prepare an access route for a track-hoe excavator and to prepare a 2:1 slope for the soil lift structure. Tree removal will affect an approximate area of 0.05 acre (approximately 150' X 15'). Trees targeted for removal include five red alders (4-10 inch dbh) and two Douglas-firs (18 inch dbh). After construction, any trees removed will be replanted or replaced. No grubbing of shrub vegetation along the access routes will occur, though some shrubs will be cut.

From the west equipment access route, a track-hoe excavator will approach the creek by piling loose riprap from the wetted stream level to the top of the cut bank to create a platform from which to construct the stream barbs. The excavator will then reverse the process, removing the excess riprap used to support the vehicle. Rock repositioning at the mouth of the old channel will be attempted from the west bank. However, if the excavator arm does not have sufficient reach, the equipment will access the site from the east side of the bridge abutment. This access route will not require the removal of any riparian trees, but will likely result in damage to several shrubs and repositioning of a few pieces of LWD in the path of the equipment. A large log jam between the old and main channels will remain in place. The deflection of flow off of the barbs will be directed towards the log jam, providing increased channel roughness and dissipation of flow energy and velocity in this reach.

The project also involves work to restabilize the "hinge" of the west wing wall where it adjoins the northwest bridge footing. Rock will be excavated away from the base of the wing wall from the west (upslope) side to expose the repair area. Approximately one cubic yard of concrete will be formed to reinforce the base of the wall on the west aspect. Concrete will be bucketed to the wall from a prep site on the road prism. Upon curing, rock will be repositioned back around the wing wall and bridge footing. Work will be conducted above the wetted stream level during summer low flows and precautions will be taken to ensure green concrete is not introduced to the creek.

The project also involves the isolation and movement of fish from the in-water work zone by trained fish biologists. Techniques will include the use of block nets to isolate the work areas, and seines and dip nets to capture and relocate fish. The use of an electro-shocker may occur only after a thorough netting of each work area has taken place in order to ascertain whether additional salmonids remain within the in-water work area.

Repair work is anticipated to begin in mid-summer 2002 to coincide with the open work window (July 1 to September 30). The repair work is expected to take 20 days, of which an estimated seven days involve in-water work.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 C.F.R. 402.02].

The action area for this project includes all areas that could potentially be affected by the proposed project. It is defined as a 1.4-acre work area approximately 200-feet wide (centered on Woodard Creek) and approximately 300 feet upstream of the Woodard Creek Bridge 14/109 and 600 feet downstream from the bridge. This area includes all proposed access routes within the WSDOT right of way, along a permanent easement obtained from Washington State Park and Recreation Commission (WSPRC), the embankment targeted for soil bioengineering, and all proposed in-water work.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Status of the Species

2.1.1.1 Lower Columbia River Chinook

In 1999, LCR ESU chinook salmon was listed as threatened under the ESA (50 Fed. Reg. 14308; March 24, 1999). This ESU, which encompasses all drainages of the LCR, includes 14 fall chinook stocks. Twelve of these stocks (including those occurring in Woodard Creek) are currently classified as healthy, while the two Toutle River stocks are considered depressed (WDF *et al*.1993b). Factors for the decline of this ESU include degradation to spawning gravel quality and stability, thermal barriers during upstream migration, and modified winter flows.

Most fall-run fish in the LCR chinook salmon ESU emigrate to the marine environment as subyearlings (Reimers and Loeffel 1967, Howell *et al.* 1985, WDF *et al.* 1993a). Returning adults that emigrated as yearling smolts may have originated from the extensive hatchery programs in the ESU. It is also possible that modifications in the river environment have altered the duration of freshwater residence. Coded Wire Tag (CWT) recoveries of LCR ESU fish suggest a northerly migration route, but (based on CWT recoveries) the fish contribute more to fisheries off British Columbia and Washington than to the Alaskan fishery. Tule fall chinook salmon return at adult ages 3 and 4; “bright” fall chinook return at ages 4 and 5, with significant numbers returning at age 6. Tule and bright chinook salmon are distinct in their spawn timing.

As in other ESUs, chinook salmon have been affected by the alteration of freshwater habitat (Bottom *et al.* 1985, WDF *et al.* 1993a, Kostow 1995). Timber harvesting and associated road building peaked in the 1930s, but effects from the timber industry remain (Kostow 1995). Agriculture is widespread in this ESU and has affected riparian vegetation and stream hydrology. The ESU is also highly affected by urbanization, including river diking and channelization, wetland draining and filling, and pollution (Kostow 1995).

The LCR ESU has been subject to intensive hatchery influence. Hatchery programs to enhance chinook salmon fisheries in the LCR began in the 1870s, releasing billions of fish over time. That equals the total hatchery releases for all other chinook ESUs combined (Myers *et al.* 1998). Although most of the stocks have come from inside the ESU, more than 200 million fish from outside the ESU have been released since 1930 (Myers *et al.* 1998).

For the LCR chinook salmon ESU as a whole, NMFS estimates that the median population growth rate (lambda) over the base period ranges from 0.98 to 0.88, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000). NMFS estimated the risk of absolute extinction for nine spawning aggregations, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness = 0), the risk of absolute extinction within 100 years ranges from zero for the Sandy River late run and Big Creek to 1.00 for Mill Creek (Table B-5 in McClure *et al.* 2000). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years is 0.99 for all but one of nine spawning aggregations (zero for the Sandy River late run; Table B-6 in McClure *et al.* 2000).

No surveys have been conducted by the Washington Department of Fish and Wildlife (WDFW) to document the presence of chinook salmon in Woodard Creek. However, according to the WDFW Area Habitat Biologist (Holman pers. comm. 2001), it is likely that there is an occasional occurrence of migrating, spawning, and/or rearing LCR chinook salmon. Suitable chinook spawning and rearing habitat is present in the action area. Fall chinook are historically native to major watersheds around Woodard Creek and presently occur in the Washougal River sub-basin (approximately 18 miles to the west), as well as the Wind and White Salmon Rivers (13 and 20 miles to the east, respectively). Upper, Middle and LCR stocks of chinook may move into Woodard Creek during upstream/downstream migrations through the CR migrational corridor**.**

2.1.1.2 Columbia River Chum

In 1998, the CR ESU chum salmon was listed as "threatened" under the ESA (63 Fed. Reg. 11774; March 10, 1998). The CR ESU includes all naturally spawning populations in the CR and its tributaries in Washington and Oregon. Historically, chum salmon were abundant in the lower reaches of the CR and once supported a major commercial fishery with landings of more than 5,000,000 fish in some years (Johnson *et al.* 1997). Today, chum salmon are limited to CR tributaries below Bonneville Dam, with primary concentrations in the Grays River, Hamilton Creek, and Hardy Creek drainages, all in the LCR. The Grays River and Hamilton Creek stocks are currently classified as Depressed and the Hardy Creek stock is considered Healthy (WDF *et al.* 1993b). The primary habitat impacts contributing to the decline of CR chum include water withdrawal, conveyance, storage and flood control, logging and agriculture, mining, urbanization, and continued loss of CR estuarine habitat (63 Fed. Reg. 11774; March 10, 1998).

Most chum salmon in Washington are classified as fall-run fish, although distinct summer and winter runs are recognized (Johnson *et al.* 1997). These races are divided based on the timing of their upstream migration and spawning activities. Spawning typically occurs in small coastal streams and the lower reaches of larger rivers, frequently in the tidal zone (WDFW website). Spawning for summer-run chum occurs mid-September to mid-October; fall-run chum spawn from November through December or January (WDF *et al.* 1993a). Chum fry hatch between March and May. Shortly after emergence, chum juveniles migrate to estuarine environments where they rear for several months before heading out to the open ocean. Chum salmon spend between two and six years in the ocean environment, however, most adult spawners are three to four years old (Wydowski and Whitney 1979).

Chum salmon enter the CR from mid-October through early December and spawn from early November to late December. Recent genetic analysis of fish from Hardy and Hamilton creeks and from the Grays River indicate that these fish are genetically distinct from other chum salmon populations in Washington. Genetic variability within and between populations in several geographic areas is similar, and populations in Washington show levels of genetic subdivision typical of those seen between summer- and fall-run populations in other areas and typical of populations within run types (Salo 1991, WDF *et al.* 1993a, Phelps *et al.* 1994, and Johnson *et al.* 1997).

Hatchery fish have had little influence on the wild component of the CR chum salmon ESU. NMFS estimates an median population growth rate (lambda) over the base period, for the ESU as a whole, of 1.04 (Tables B-2a and B-2b in McClure *et al.* 2000). Because census data are peak counts (and because the precision of those counts decreases markedly during the spawning season as water levels and turbidity rise), NMFS is unable to estimate the risk of absolute extinction for this ESU.

Washington Department of Fisheries (WDF) (1973) reported that chum salmon spawn in the lower reaches of several smaller streams near Bonneville Dam, which is situated about four river miles upstream from Woodard Creek. Spawning chum have been documented in the lower reaches of Hardy and Hamilton creeks, the drainages immediately east of Woodard Creek by two and three miles, respectively. A former production area in Duncan Creek (the drainage immediately west of Woodard Creek, by 1.5 miles) was reduced to minor importance by a dam constructed in 1964 (WDF 1973). It is unknown whether a native, naturally spawning population exists in Woodard Creek, however, there is a good potential for the reestablishment of naturally producing populations through straying of adult fish from nearby Hardy, Hamilton, and Duncan creeks. Because chum are known to spawn in a wide variety of locations (Johnson *et al.* 1997), and generally select shallower, slower-running streams more frequently than other salmonids, suitable chum spawning, incubation, and migration habitat is likely present in the action area. Holman (pers. comm.) corroborates that the presence of chum salmon in Woodard Creek is very likely.

2.1.1.3 Lower Columbia River Steelhead

In 1998, LCR ESU steelhead was listed as threatened under the ESA (63 Fed. Reg. 11798; March 19). In Washington, the LCR steelhead occupy tributaries to the CR between the Cowlitz and Wind Rivers. Steelhead from the Little and Big White Salmon Rivers are not included.

LCR steelhead are of the coastal genetic group, and a number of genetic studies have shown that they are part of a different ancestral lineage than inland steelhead from the CR Basin. Genetic data also show steelhead from this ESU to be distinct from steelhead from the upper Willamette River and coastal streams in Oregon and Washington. This ESU is composed of both winter- and summer-run steelhead. Hatchery populations considered part of the ESU include late-spawning Cowlitz Trout Hatchery stock (winter-run) and Clackamas River Oregon Department of Fish and Wildlife stock #122. There is widespread production of hatchery steelhead within the ESU. Data indicate that hatchery fish represent approximately 50% of the total escapement for this ESU (Busby *et al*. 1996).

Though populations have declined, steelhead are still found throughout much of their historic range in the ESU. Fourteen stocks of steelhead within the LCR ESU were identified as depressed based on chronically low or short-term, severe declines in wild spawner escapement levels (WDF *et al.* 1993a). Factors leading to the decline of the species include logging, agriculture, mining, and urbanization, all of which contribute to the degradation and loss of steelhead habitat. Other factors, such as incidental harvest mortality from sport and commercial fisheries, hatchery introgression, predation of smolts and returning adults, construction of dams, and the eruption of Mt. St. Helens have also contributed to this ESU's decline.

Steelhead in this ESU are thought to use estuarine habitats extensively during outmigration, smoltification, and spawning migrations. The lower reaches of the CR are highly modified by urbanization and dredging for navigation. The upland areas covered by this ESU are extensively logged, affecting water quality in the smaller streams used primarily by summer runs. In addition, all major tributaries used by LCR steelhead have some form of hydraulic barrier that impedes fish passage. Barriers range from impassible structures in the Sandy River basin that block access to extensive, historically occupied, steelhead habitat, to passable but disruptive projects on the Cowlitz and Lewis rivers. The Biological Review Team (BRT 1997) viewed the overall effect of hydrosystem activities on this ESU as an important determinant of extinction risk.

Many populations of steelhead in the LCR ESU are dominated by hatchery escapement. Roughly 500,000 hatchery-raised steelhead are released into drainages within this ESU each year. As a result, first-generation hatchery fish are thought to make up 50% to 80% of the fish counted on natural spawning grounds. The effect of hatchery fish is not uniform, however. Several runs are mostly hatchery strays (*e.g.*, the winter run in the Cowlitz River [92%] and the Kalama River [77%] and the summer run in the North Fork Washougal River [50%]), whereas others are almost free of hatchery influence (the summer run in the mainstem Washougal River [0%] and the winter runs in the North Fork Toutle and Wind rivers [0% to 1%]).

For the LCR steelhead ESU as a whole, NMFS estimates that the median population growth rate
(lambda) over the base period ranges from 0.98 to 0.78, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000). NMFS has also estimated the risk of absolute extinction for seven of the spawning aggregations, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness = 0), the risk of absolute extinction within 100 years ranges from zero for the Kalama River summer run and the Clackamas River and Kalama River winter runs to

1.00 for the Clackamas River summer run and the Toutle River winter run (Table B-5 in McClure *et al.* 2000). Assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years rises to 1.00 for all but one population (the risk of extinction is 0.86 for the Green River winter run; Table B-6 in McClure *et al.* 2000).

All life stages of steelhead are likely to occur in Woodard Creek (Holman pers. comm. 2001), though specific spawner surveys have not been conducted. Habitat conditions in the Woodard Creek watershed appear to be very suitable for steelhead production. The nearest documented wild-production area is a winter steelhead run in Hamilton Creek, approximately 3 miles east of Woodard Creek. Summer and winter steelhead stocks also occur in the surrounding Washougal, Wind, and Klickitat rivers. The presence of good habitat and the proximity of these naturally producing populations suggests that there is a high probability that steelhead inhabit Woodard Creek. Essential habitat features for steelhead include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, and safe passage conditions. Recent and historical information related to abundance and life history is summarized in Busby *et al*. (1996), Spence *et al.* (1996), and NMFS (1998a, 1998b, and 1998c).

2.1.2 Evaluating the Proposed Action

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined in 50 C.F.R. 402. The NMFS must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributed to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize the continued existence of the listed species, then NMFS must identify reasonable and prudent alternatives for the action.

Guidance for making determinations of jeopardy is contained in *The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids*, August 1999 (NMFS 1999).

2.1.3 Biological Requirements

The relevant biological requirements are those necessary for LCR steelhead, and LCR chinook and CR chum salmon and to survive and recover to naturally reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to and survive various environmental conditions, and allow them to become self-sustaining in the natural environment.

Essential features of salmonid habitat that support their biological requirements include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space and safe passage conditions (Simenstad *et al.* 1982, Palmisano *et al.* 1993, Spence *et al.* 1996). For this consultation, the biological requirements which will be adversely affected are water quality, the disturbance of streambed and riparian habitat structures, and safe passage due to isolation and handling. The biological requirements are further defined as properly functioning conditions (PFC) of habitat conditions that are relevant to any chinook, chum, or steelhead life stage. These habitat conditions include all parameters of the matrix of pathways and indicators described in NMFS (1996).

Information related to biological requirements for LCR chinook salmon, LCR steelhead and CR chum can be found in Busby *et al*. (1996) and NMFS (1998a, 1998b, and 1998c). Presently, the biological requirements of listed species are not being met under the environmental baseline. As a general matter, to improve the status of the listed species, improvements in the functional condition of habitat are needed.

2.1.4 Environmental Baseline

The environmental baseline represents the current set of basal conditions to which the effects of the proposed action are then added. Environmental baseline is defined as "the past and present impacts of all Federal, State, and private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or informal section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process" (50 C.F.R 402.02). The term "action area" is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action."

The action area for this project includes a 1.4-acre work area approximately 200-feet wide (centered on Woodard Creek) and approximately 300 feet upstream of the Woodard Creek Bridge 14/109 and 600 feet downstream of the bridge. This area includes all proposed access routes within the WSDOT right-of-way, along a permanent easement obtained from WSPRC, the embankment targeted for soil bioengineering, and all proposed in-water work.

The Woodard Creek Bridge 14/109 crosses Woodard Creek at river mile (RM) 0.6. Woodard Creek comprises an independent drainage within the 7,000-acre Salmon/Washougal Water Resource Inventory Area (WRIA #28). Woodard Creek's confluence with the CR is at RM 141.

The Woodard Creek channel in the vicinity of the bridge has been significantly altered. An abandoned roadbed of unknown construction date is evident along the west bank of the creek immediately north of the bridge. A portion of this roadway has sloughed away with the embankment failure. It likely was built to access two quarry sites located up-drainage from the bridge. The roadbed appears to function as a dike that confines the Woodard Creek channel. The natural topography of the area suggests that the pre-roadbed channel was substantially wider with some flow meandering southwest of the current channel. An old channel of Woodard Creek is still apparent on Washington State Parks and Recreation Commission (WSPRC) property south of SR 14. There are anecdotal reports that the Fulton Creek channel was diverted around the turn of the century so as to minimize the number of crossings required of the new rail line (Plunkett pers. comm. 2001). It is possible that these historic modifications to the Woodard Creek channel have contributed to the existing embankment failure at the bridge.

An evaluation of the baseline environmental conditions for the action area was conducted for chinook and chum salmon and steelhead trout following the guidance of Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NMFS 1996). This evaluation assessed various baseline indicators and determined whether the proposed project would restore, maintain, or degrade existing baseline conditions at the watershed and project area level.

Constituent elements of suitable chinook habitat are present within the action area with some limitations. Low to moderate levels of LWD, good riparian cover, and clean, proper-sized substrate is available. However, seasonally low flows may limit the depth of pool habitat needed by chinook.

Several factors currently affect species environment for listed salmonids within the action area. These include unstable stream banks, physical barriers to migrating salmonids, and reduced floodplain connectivity. As discussed previously in this document, an existing bank failure located north of the Woodard Creek Bridge is currently resulting in a loss of stable riparian habitat and increasing the delivery of sediments into the creek. Sedimentation may degrade both water quality and in-stream habitat required by salmonids. Moreover, the observed bank failure and the resulting sedimentation are likely contributing factors in the buildup of a delta at the confluence of Woodard Creek and the CR. The delta has been identified as a partial blockage to fish migration between Woodard Creek and the CR. There are several factors that contribute to a reduction in floodplain connectivity of Woodard Creek within the action area. These include the Woodard Creek Bridge 14/109 and, immediately downstream of the action area, the Burlington Northern-Santa Fe rail line. Moreover, a flood events in the late 1990's resulted in the deposition of boulders and large cobbles that have blocked an old side channel and effectively “pinched” the floodplain upstream of the Woodard Creek Bridge. As a consequence, salmonids no longer have access to this side channel.

At the action area scale, the proposed project will affect several pathway indicators, including sediment/turbidity, physical barriers, LWD, off-channel habitat, streambank condition, and floodplain connectivity. While construction activities will result in minor, short term increases in sediment/turbidity, streambank repair activities (included in the project action) will produce long-term improvements in the baseline indicator by stabilizing a significant source of sediment. Moreover, and as discussed above, the project will improve the baseline indicators for physical barriers, LWD, off-channel habitat, streambank condition, and floodplain connectivity within the project area. Consequently, the project will either maintain or improve the environmental baseline at the action area scale.

2.1.5 Effects of the Proposed Action

The proposed repair and stabilization of bank erosion adjacent to the Woodard Creek Bridge is likely to adversely affect LCR chinook, CR chum, and LCR steelhead. The ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." Indirect effects are those that are caused by the proposed action, are later in time, but are still reasonably certain to occur (50 C.F.R 402.02).

With the focus of this project on the repair and permanent stabilization of an erosion-prone segment of the Woodard Creek streambank associated with Bridge 14/109, the potential for adverse affects to listed salmonids exists. Though work is planned during summer low-flow conditions, the project will likely involve work within the wetted perimeter of Woodard Creek. Chinook salmon and steelhead within the action area may be susceptible to direct, indirect, and/or beneficial effects of project activities that may potentially impact habitat elements, food resources, and individual fish.

2.1.5.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated actions and interdependent actions. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated.

Juvenile and adult steelhead and chinook salmon may inhabit the action area during the proposed construction periods. The direct impacts of the project covered in this BO will be the loss of rearing habitat or habitat structure. Additionally, the placement of materials and the attendant in-water work will contribute sediment to the water column, thus affecting water quality. The placement of rock barbs to redirect flow will likely have permanent, though not necessarily negative, affects on the flow regime. The addition of features such as LWD and opening the secondary channel will of themselves also alter the flow regime and change habitat structure of the system, presumably in a positive fashion. Generally, the direct effects are related to the extent and duration (20 working days, of which approximately seven days will involve in-water work) of construction activities in or adjacent to Woodard Creek. The adverse effects associated with the proposed project are likely to be short in duration and will be minimized through restrictions in timing of construction, isolating or excluding fish from the action area, and the implementation of a Temporary Erosion and Sediment Control Plan (TESC) and Best Management Practices (BMPs).

Multiple stress factors will have incremental effects on the species, adding to the overall stress encountered throughout their life stages. The effects of any one factor for decline can be complicated by the influence of others. For example, if a population was exposed to a prolonged series of low flows, lowered dissolved oxygen (DO), and/or increased water temperatures, it may be more readily infected with disease organisms that further weakens its resistance to new temperature, DO, and/or contaminant exposures, or other physical or biological factors (Arkoosh *et al.* 1998a, 1998b, 2001). This exposure can leave the population weakened from energy depletion through inadequate food intake, high metabolic costs, and negative growth. The probability of increased mortality from predation, disease and competition in these cases is greater than when a population is confronted with only one factor for decline.

The impacts to these features will be both temporary and long-term to rearing and habitat characteristics that function to support successful rearing and migration.

2.1.5.1.1 Water Quality

Potential negative effects associated with grading/excavation, placement of rock, and removal of riparian vegetation in the construction area include temporary increases in turbidity and sediment levels during construction. Short term negative effects include deposition of fine sediment that can significantly degrade in-stream spawning habitat and reduce survival of steelhead from egg to emergence (Phillips *et al*. 1975), sub-lethal effects from suspended sediments (*e.g.*, elevated blood sugars and cough rates (Servizi and Martens 1992), physiological stress and reduced growth, loss of inter-gravel cover for fish from increased sediment levels (Spence *et al.* 1996), avoidance of suspended sediments by juvenile salmonids (Bisson and Bilby 1982; Servizi and Martens 1992), and elevated turbidity levels that can reduce the ability of salmonids to detect prey and can cause gill damage (Sigler 1980; Lloyd *et al.* 1987). Moderate turbidity levels (11 to 49 NTU's) also may cause juvenile steelhead and coho to leave rearing areas (Sigler *et al.* 1984). Additionally, short-term pulses of suspended sediment have been shown to influence territorial gill-flaring, and feeding behavior of salmon under laboratory conditions (Berg and Northcote 1985).

WSDOT will minimize potential negative effects by restricting the timing of construction and using erosion-control measures identified in the BA. It is expected that listed species present during construction either will seek refugia or will avoid portions of stream with high turbidity and sediment levels. In the long-term, however, it is anticipated that bank repair and stabilization work will halt erosion of the scoured bank near the west bridge abutment, thereby improving baseline indicators for sediment and turbidity. In order to minimize short-term water quality impacts the contractor will: 1) implement a temporary sediment and erosion control plan during all phases of the project action, 2) limit in-water work to the low-flow period (July 1 to September 30), 3) ensure that all equipment used for this project are free of external petroleum-based products while working around the stream, 4) equipment shall be checked daily for leaks and any necessary repairs shall be completed prior to commencing work activities along the stream.

2.1.5.1.2 Streambed and Bank Disturbance

The installation of barb structures and repair of the west wing wall will disturb the substrate of Woodard Creek. It is unlikely that the in-stream work will adversely affect spawning habitat although in-stream work may harm fish by homogenizing the substrate and reducing the diversity of benthic habitat in the river bed. Additionally, the use of heavy equipment in the riparian areas and within the streambed may cause compaction of soils resulting in reduced infiltration at the project site. Such compacting decreases the stability of the banks and reduces recruitment of riparian vegetation, which might result in increased deposition of fine sediments into the river.

To minimize the disturbance of the creek bed, the contractor will: 1) complete all in-water work during the work window July 1 to September 30, 2) limit operation of heavy equipment to the west bank of Woodard Creek and/or from atop the newly constructed barb structures, and 3) prevent the drive mechanisms (wheels, tracks, tires, etc.) from entering or operating below the ordinary high water mark.

Moreover, LWD incorporated into each of the three stream barbs will provide additional microhabitat for salmonids and their prey species, promote gravel recruitment, and help reverse the effects of channel incision along the west bank of Woodard Creek. Stream barbs will function to roughen the channel, creating low-energy refugia for salmonids during peak flows. Likewise the barbs will produce scour holes, which will provide quality pools for salmonids during low flows. In addition, opening a channel presently blocked by an accumulation of boulders and large cobble will improve floodplain connectivity of Woodard Creek, increase the formation of off-channel habitat, and increase aquatic habitat suitable for rearing, spawning, foraging, and migrating salmonids.

2.1.5.1.3 Safe Passage Due to Isolation and Handling

Isolation can significantly impact fish in the area, if specific measures are not taken. The methods for isolating the work area from the active stream can range from use of inflatable bags and sandbags to sheet piling of various materials. Redirecting flow might strand fish rearing along stream margins. Invertebrate prey production at the location of bag or sheet pile placement will be affected for the duration of the action. Poorly screened intake structures can cause impingement of salmonids and subsequent injury or mortality. Capture and release methods can also injure or kill individual fish. For example, electrofishing can result in direct mortality of salmonids. In Oregon, short-term mortality (within 72 hours) of brook trout (*Salvelinus fontinalis*) was 10% after single-pass electrofishing (Mahoney 1997). Physical injuries from electrofishing include internal hemorrhaging, spinal misalignment, or fracture of vertebrae. Generally, the relative effects of electrofishing at the population level remain unknown.

To minimize the adverse effects of isolation and fish handling, the contractor will employ a trained fish biologist to supervise the isolation and movement of fish from the in-water work zone. Techniques will include the use of block nets to isolate the work areas, and seines and dip nets to capture and relocate fish. The use of an electro-shocker may occur only after a thorough netting of each work area has taken place in order to ascertain whether additional salmonids remain within the in-water work area.

2.1.5.1.4 Interrelated and Interdependent Effects

This project consists entirely of the stabilization of an existing bridge structure and the repair of a section of Woodard Creek, and, consequently, interrelated or interdependent effects are not anticipated to result from the project.

2.1.5.2 Indirect Effect

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or they are a logical extension of the proposed action.

2.1.5.2.1 Riparian and Fisheries Habitat

Riparian vegetation links terrestrial and aquatic ecosystems, influences channel processes, contributes organic debris to streams, stabilizes streambanks, and modifies water temperatures (Gregory *et al.* 1991). Removal of vegetation may result in increased water temperatures that would further degrade already impaired water temperatures in the action area. Elevated water temperatures may influence numerous attributes of salmonids including physiology, growth and development, life history patterns, disease, and competitive predator-prey interactions (Spence *et al.* 1996). Loss of vegetation also may reduce allochthonous inputs to the stream. Woody debris provides essential functions in streams including the formation of habitats. Additionally, the removal of vegetation decreases streambank stability and resistance to erosion.

The riparian corridors in Woodard Creek watershed provide adequate shade, LWD recruitment, habitat function and connectivity, and fully reflect the composition of the native plant community. Disturbance of the riparian area is considered minimal, being limited to natural fluctuations related to plant succession and intermittent flood events. County- and state-designated riparian and shoreline buffers and state-mandated Forest Practice rules provide long-term protection for riparian habitats. The proposed action will require the removal of five red alder and two Douglas fir trees and damage to native shrub vegetation within the equipment access corridor, impacting an area of <0.05 acre. Replacement trees will planted at project completion. In addition, riparian plantings will be incorporated into the soil lift structure, increasing the current coverage of riparian vegetation in the project area. The removal of riparian vegetation will have discountable impacts on Woodard Creek riparian reserves, stream temperatures, and LWD recruitment.

2.1.5.2.3 In-water Structures

The introduction of stream-barb structures upstream of Woodard Creek Bridge is intended to permanently modify existing hydraulic functions near the bridge. The barbs will disrupt secondary flow cells across the creek bottom and redirect that flow away from the west bank toward the center of the creek and through the center of the bridge. The flow realignment is expected to eliminate the causative agent of bank erosion occurring at the bridge site. The barbs are expected to create channel roughness and provide a low-energy environment for fish to seek refuge during periods of high flow. Barbs also produce useful scour holes on their downstream side that provide refugia during low flows (WDFW 1998). Installation of barbs will result in a net increase in width-to-depth ratio of Woodard Creek, which may produce increased backwater (upstream from the barbs) at high flows. The introduction of LWD into stream barbs and at key locations along the eroded bank will assist in dissipating water velocity and, thereby, buffer the incising effects of peak flows. LWD is also intended to improve shelter, velocity refugia, pool formation, channel complexity, and LWD recruitment for rearing salmon, which may result in improved production of local salmonid populations.

To minimize adverse effects caused by the in-water structures, the contractor will: 1) incorporate fish habitat structures (*i.e.*, LWD) into each of the three barb structures, 2) install geotextile-enclosed mats above and between barbs, and establish willow cuttings and/or other native woody vegetation in available spaces between and among the mats to form a heavily vegetated bank, and 3) avoid disturbance to an existing log jam located on the island between the main channel of Woodard Creek and the eastern overflow channel. In addition, the length of each barb will not exceed 10 feet (*i.e.*, 1/3 the width of the stream channel) to permit the passage of fish under all flow conditions.

2.1.5.2.4 Reopening of Side Channel

The repositioning of large rock and cobble to open an old side channel will create additional long-term or permanent changes to the hydrology of Woodard Creek in the vicinity of the bridge. Flow introduced to the old channel will bypass (and reduce water volume in) the main channel, further dissipating flow energy around the stream barbs and west streambank. This activity will increase the wetted width of the creek, creating in-water habitat for aquatic macroinvertebrates and salmonids, additional flow capacity during high flow events, and channel flow to convey LWD and other organic detritus to the watershed.

2.1.5.2.5 Sedimentation

The Woodard Creek bank repair work will take time before bank stabilization is attained. The process is expected to result in gradually decreasing deposition of sediments to the watershed until the stream barbs, LWD, and soil lift structures have stabilized. This level of sedimentation is expected to be within normal limits and representative of surface erosion occurring throughout Woodard Creek Watershed, with no measurable affects to water quality, individual salmonids, or their prey species. As bank stabilization proceeds, erosion from the undercut embankment will subside and result in long term improvement to baseline conditions for water quality and streambank condition.

2.1.5.2.6 Bank Revegetation

The geotextile soil lift structure and planting of live willow cuttings in the stream barbs will accelerate the establishment of native woody vegetation along the exposed west bank of Woodard Creek. Woody shrubs and trees will eventually help to anchor bank and stream channel soils, reduce scouring during high-water events, and add shade, leaf litter, and other organic matter to the Woodard Creek system.

2.1.6 Cumulative Effects

Cumulative effects are defined as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 C.F.R 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The impacts from future development can have incremental effects on habitat that cumulatively result in significant impacts to listed species. Common impacts to salmonids from development include the degradation of water quality and hydrology from an increase of impervious surfaces, loss of riparian habitat, culverting of streams, and increased sedimentation during construction.

Typical non-Federal actions reasonably certain to occur in Skamania County – and in the project vicinity – include timber harvest operations, development and maintenance associated with Beacon Rock State Park, and some residential and urban development.

Skamania County is one of the least populated counties in Washington State (ranked at #35 in descending order out of 39 counties), with a Year 2000 population estimate of 9,900 (Office of Financial Management [OFM] 2001). Since 1990, Skamania County's population has grown by 1,611 persons, representing a 19% increase over a 10-year period. No population forecasts or growth projections are available from Skamania County (Pearson pers. comm.) or OFM.

While specific figures are not available, land availability in the Urban and General Management Areas for long-term population forecasts is deemed sufficient and nowhere near build-out conditions (Pearson pers. comm.). Due to the prevalence of National Forest, Gorge Scenic Area, State Park, State Forest, and private forest and agricultural lands in Skamania County (90.2% of the county's land base), loss of forest and agricultural land is not a critical issue (Pearson pers. comm.).

No large master-planned developments are currently proposed in Skamania County. Based on the acreage identified in Skamania County Urban and General Management Areas, the upper end estimate of impervious surface in Skamania County is 22,000 acres, or about two percent of the total county land base (Pearson pers. comm.).

The Skamania County code also regulates activities within 1,000 feet of sensitive wildlife and plant areas. Such activities require review by WDFW. Preparation of a wildlife management plan or protection and rehabilitation plan is required for land use activities that are likely to adversely affect these areas. The plan must implement appropriate protective and/or mitigation measures to be approved by the County.

Future activities planned for the 4,650-acre Beacon Rock State Park include trail development, upgrades to the boat ramp and parking facility, development of a day-use area, and development of a 50-unit campground. These actions are anticipated to occur over the next five years. Trail development will primarily occur on park lands located more than one mile ease of Woodard Creek.

Beacon Rock State Park recently acquired the "Doestch" parcel, located south of State Route (SR) 14, which adjoins the boat launch facility (Malmberg pers. comm.). Plans are to develop this parcel into a day-use area incorporating proper buffer distances and sewer treatment measures to avoid any adverse impact to Woodard Creek. Ground-breaking for the 50-unit campground development is anticipated in the near future. This facility will be developed on an upland site at least 0.25 mile west of Woodard Creek and north or SR 14. Some trail development will occur in tandem with the new campground facility.

Lastly, park managers have identified a progressive build-up of sediments at the mouth of Woodard Creek that, depending on the flows, may be creating a barrier to salmonid migration. Malmberg (pers. comm.) reports that the delta area has risen in height by as much as four feet over the past couple years.

In conclusion, the low occurrence of future actions anticipated from State park facility developments, timber harvest and management, and residential development are expected to have negligible cumulative impacts on the environmental baseline of Woodard Creek, and, thus, should have discountable effects on LCR steelhead, and LCR chinook and CR chum salmon.

2.1.7 Conclusion

The proposed action is not likely to jeopardize the continued existence of LCR steelhead, CR chum, or LCR chinook salmon. There will be short-term direct effects associated with the proposed activities. The installation of barb structures, construction of the soil lift structure, reinforcement of the wing-wall structure, removal of fish from in-water construction areas, and increased sediment levels will result in temporary displacement of fish in Woodard Creek. The direct and indirect effects will be minimized through the use of BMPs in the design and construction. The determination of no jeopardy was based on the following: 1) timing restrictions related to in-water construction are expected to minimize impacts to fish and their habitat, 2) bank stabilization work will halt erosion of the scoured bank near the west bridge abutment, thereby improving baseline indicators for sediment and turbidity, 3) LWD incorporated into the stream barbs and west bank will provide additional microhabitat for salmonids and their prey species, will promote gravel recruitment, and will help reverse the effects of channel incision along the west bank of Woodard Creek, 4) stream barbs will function to roughen the channel, creating-low-energy refugia for salmonids during high flows; likewise the barbs will produce useful scour holes, which will provide quality pools for salmonids during low flows, 5) opening a channel presently blocked by an accumulation of boulders and large cobble will improve floodplain connectivity of Woodard Creek, increase the formation of off-channel habitat, and increase aquatic habitat suitable for rearing, spawning, foraging, and migrating salmonids, 6) Riparian vegetation removal will be replaced at a 1:1 ratio. NMFS concludes that the proposed action is not likely to impair properly functioning habitat or appreciably reduce the functioning of already impacted habitat. Furthermore, NMFS concludes that the proposed action no activities that are likely to adversely affect the species at the population level. Overall, the proposed activities are not expected to appreciably reduce the likelihood of survival and recovery of LCR steelhead, LCR chinook, or CR chum.

2.1.8 Reinitiation of Consultation

This concludes consultation for the SR 14 Woodard Creek Bridge stabilization and streambank repair project. Consultation must be reinitiated if the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R. 402.16). To reinitiate consultation, the COE should contact the Habitat Conservation Division (Washington Branch Office) of NMFS.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4 (d) of the Act prohibit the take of endangered and threatened species without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined as significant habitat modification or degradation that results in death or injury to listed species by "significantly impairing behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering" (50 C.F.R. 222.102). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(a)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such takings is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the effects of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize take and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of Anticipated Take

The proposed action is reasonably certain to result in incidental take through harm and harassment of juvenile and adult LCR steelhead and juvenile CR chum and LCR chinook salmon. The exact numerical amount of expected take is difficult to determine, and therefore has not been quantified. However, NMFS believes that there are several mechanisms through which take of the above-listed species may occur and the extent to which these mechanisms will occur under the proposed action was discussed in the analysis of effects. Direct harm or injury may occur when listed species are captured and moved from the in-water work area and/or when riprap is placed (or moved) in the stream channel. Indirect harm may result from diesel and/or oil from equipment entering the creek, turbidity caused by in-water construction, and elevated water temperature resulting from the loss of riparian vegetation.

2.2.2 Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures (RPM) are necessary and appropriate to minimize incidental take of LCR steelhead, LCR chinook, and CR chum:

1. To minimize the amount and extent of incidental take from construction activities, measures shall be taken to limit the timing, duration, and extent of construction within the OHWM.

2. To minimize the amount and extent of incidental take from isolation and fish handling, measures shall be taken ensure that prudent methods are used that will minimize risk of injury to liste species.

3. To minimize the amount and extent of incidental take from construction activities in or near the creek, effective erosion and pollution control measures shall be developed and implemented throughout the area of disturbance and for the life of the project. The measures shall minimize the movement of soils and sediments both into and within the creek, and stabilize bare soil over both the short and long term.

5. To minimize the amount and extent of take from loss of instream habitat, measures shall be taken to minimize impacts to riparian and instream habitat, or where impacts are unavoidable, to replace or restore lost riparian and instream function.

6. To ensure effectiveness of implementation of the RPMs, the erosion control measures and plantings for site restoration shall be monitored and evaluated both during and following construction, and meet criteria as described below in the terms and conditions.

2.2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the COE must ensure that WSDOT complies with the following terms and conditions, which implement the RPMs described above. Implementation of the terms and conditions within this BO will further reduce the risk of impacts to LCR steelhead and LCR chinook and CR chum salmon. These terms and conditions are non-discretionary.

1. To implement RPM No. 1 (construction within the OHWM) above, the COE shall ensure that:

    1.1 All work within the active channel of Woodard Creek will be completed between July 1st and October 31st. Any additional extensions of the in-water work period will first be approved by, and coordinated with, NMFS and WDFW.

    1.2 Planned alteration or disturbance of stream banks and existing riparian vegetation will be minimized to extent described in the BA.

    1.3 All water intakes used for the project, including pumps used to work in-water work areas, will have fish screens installed, operated, and maintained according to NMFS' fish screen criteria.[1]

2. To implement RPM No. 2 (isolation and fish handling), the COE shall ensure that the following requirements are fully implemented.

    2.1 The in-water work area shall be well isolated from the flowing stream using the measures described in the BA and which are incorporated here by reference.

    2.2 A fishery biologist experienced with work area isolation and competent shall ensure the safe handling of all ESA-listed fish and shall conduct or supervise the entire capture and release operation.

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[1] NMFS, Juvenile Fish Screen Criteria (revised February 16, 1995) and Addendum: Juvenile Fish Screen Criteria for Pump Intakes (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

2.3 If electrofishing equipment is used to capture fish, the capture team must comply with NMFS' electrofishing guidelines[2].

2.4 The capture team must handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

2.5 Captured fish must be released as near as possible to the capture area.

2.6 ESA-listed fish may not be transferred to anyone except NMFS personnel, unless otherwise approved in writing by NMFS.

2.7 Other Federal, state, and local permits necessary to conduct the capture and release activity must be obtained.

2.8 NMFS or its designated representative must be allowed to accompany the capture team during the capture and release activity, and must be allowed to inspect the capture team's capture and release records and facilities.

2.9 The capture team must complete the In-Water Construction Monitoring Report form (Appendix 1) for all salmonids encountered during isolation and fish-movement operations.

By December 31 of the year following the completion of construction, the COE shall submit to NMFS (Washington Branch) a monitoring report with the results of the monitoring.

3. To implement RPM No. 3 (construction activities), the COE shall ensure that all TESC and pollution control measures included in the BA are included as special provisions in the contract. NMFS requires the COE to pay particular attention to preparation of an TESC plan as follows: An TESC plan will be prepared by the COE, WSDOT, or the Contractor and implemented by the Contractor. The TESC plan will outline how and to what specifications various erosion control devices will be installed to meet water quality standards, and will provide a specific inspection protocol and time response. Erosion control measures shall be sufficient to ensure compliance with applicable water quality standards and this BO. The TESC plan shall be maintained on site and shall be available for review upon request.

3.1 TESC measures shall be in-place at all times during the contract. Construction within the project vicinity will not begin until all temporary erosion controls (*e.g.*,

[2] NMFS, Backpack Electrofishing Guidelines (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

sediment barriers and containment curtains) are in place. Erosion control structures will be maintained throughout the life of the contract.

3.2 All exposed areas will be replanted with a native seed mix. Erosion control planting will be completed on all areas of bare soil before October 31.

3.3 All equipment used for in-water work will be cleaned prior to entering the active channel of Woodard Creek. External oil and grease will be removed. Untreated wash and rinse water will not be discharged into streams and rivers without adequate treatment.

3.4 Material removed during excavation shall only be placed in upland locations, at least 50 feet from the active channel and shall be prevented from eroding back into the channel.

3.5 Measures will be taken to prevent construction debris from falling into the stream or riparian area. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

3.6 The Contractor will develop an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan (PCP), and is responsible for containment and removal of any toxicants released. The Contractor will be monitored by the COE (through WSDOT) to ensure compliance with this PCP.

3.7 Areas for fuel storage, refueling, and servicing of construction equipment and vehicles will be at least 150 feet from the stream channel and all machinery fueling and maintenance will occur within a contained area. Overnight storage of vehicles and equipment must also occur in designated staging areas.

3.8 No surface application of nitrogen fertilizer will be used within 50 feet of any water of the state of Washington.

4. To implement RPM No. 4 (riparian habitat protection), the COE shall ensure that:

4.1 Alteration of native vegetation will be minimized. Where native vegetation will be altered, measures shall be taken to ensure that roots are left intact. This will reduce erosion while still allowing room to work.

4.2 Riparian vegetation removed will be replaced with a native seed mix, shrubs, and trees. Replacement will occur within the project vicinity.

5. To implement RPM No. 5 (monitoring), the COE shall ensure that:

5.1 Erosion control measures as described above in RPM No. 2 shall be monitored.

5.2 All significant riparian plantings will be monitored to ensure that finished grade slopes are at stable angles of repose and plantings are performing correctly with an adequate success rate.

5.3 For a period of three years, any dead plantings shall be replaced. If failed plantings are deemed unlikely to succeed, replacement plantings shall be conducted at other appropriate locations in the project area.

5.4 By December 31 of the year following the completion of construction, the COE shall submit to NMFS (Washington Branch) a monitoring report with the results of the monitoring required in terms and conditions 5.1 to 5.3 above.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of Essential Fish Habitat

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for two species of federally-managed Pacific salmon: chinook, coho salmon (*O. kisutch*), and pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in Sections 1.3 and 1.4 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

3.4 Effects of Proposed Actions

As described in detail in Section 2.1.5 of this document, the proposed action may result in detrimental short-term impacts to habitat parameters. These adverse effects are:

1. Short-term degradation of water quality in the action area due to an increase in turbidity during in-water construction.

2. Short-term degradation of habitat due to the installation of stream barbs and the removal of riparian trees and vegetation.

3.5 Conclusion

NMFS believes that the proposed actions may adversely affect EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions that would adversely affect EFH. While NMFS understands that the conservation measures described in the Biological Assessment will be implemented by the WSDOT, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. Consequently, NMFS recommends that the WSDOT implement the following conservation measures to minimize the potential adverse effects to EFH for chinook and coho salmon:

1. Adopt Terms and Conditions 1.1 through 1.3, and 3.1 through 3.9, as described in Section 2.2.3, to minimize EFH adverse affects #1.

2. Adopt Terms and Conditions 4.1, 4.2, and 5.1 through 5.4, as described in Section 2.2.3, to minimize EFH adverse affects #2.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 C.F.R. 600.920(k)).

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APPENDIX I
In-Water Construction Monitoring Report

In-Water Construction Monitoring Report
Woodard Creek Bridge Repair (NMFS WSB-01-401)

Start Date: ________________
End Date: ________________

Waterway: Woodard Creek, Skamania County

Construction Activities:

____
____
____
____
____
____

Number of fish observed: ____________
Number of salmonid juveniles observed (what kind?): ____________________________________
Number of salmonid adults observed (what kind?): ____________________________________

What were fish observed doing prior to construction? ____________________________________
____
____

What did the fish do during and after construction? ____________________________________
____
____
____
____

Number of fish stranded as a result of this activity: ___________

How long were the fish stranded before captured and released to flowing water?
____
____
____

Number of fish were killed during this activity: ___________

Send report to: National Marine Fisheries Service, Washington State Habitat Branch (WSB-01-401), 510 Desmond Drive SE, Suite 103, Lacey, Washington 98503